

## SYSTEM AND METHOD FOR MEASURING WEB PAGE ADVERTISEMENT IMPRESSIONS

### BACKGROUND OF THE INVENTION

#### 5 1. Field of the Invention

The present invention generally relates to computer networks. More particularly, the present invention relates to web pages on a network, such as the Internet, that display advertisements, and a system and method to monitor user interaction with the advertisements.

#### 10 2. Description of the Related Art

The “Internet” or the “World-Wide-Web” is a medium that is increasingly used for advertising products and services. There are many commercial websites that provide individual interactive “pages” to a user on the Internet and the user can interact with the web pages of the website through the graphic-user interface (GUI) of the browser 15 program resident on the computer of the user. Many websites provide useful information to users without charges to the user and the website hosts rely exclusively on advertising income to fund their continuing presence on the Internet. The advertisements are typically in separate, predefined spaces (i.e., areas or locations) on the web page, an example being a “banner ad,” and the advertisements can include Java applets or other 20 executing programs to provide motion and sound to the specific advertisement. The advertisement space can also serve as a link to the website of the particular advertiser of that advertisement such that the user can “click on,” or activate the link to move the browser to the advertiser website.

For the website hosts that are funded by advertisement space sales, the value of the advertising space is often based on the number of impressions the website host can provide to the advertiser for the specific advertisement on the web page. Thus, website hosts desire to accurately measure the number of users who see the advertisements and 5 how long each advertisement impression lasts in order to better rate advertising effectiveness for Internet advertisers. Unfortunately, there are no effective tools for obtaining these essential measurements, and as a result, advertisers are often wary about committing significant advertising dollars for web page advertisements.

One example of a current method to rate web page advertisement space 10 effectiveness is called a "Click-through" ratio. A "click-through" ratio is defined as the number of users who "click on," or activate, a specific advertisement to the number of times the base web page is accessed by users. The "click-through" ratio, however, does not provide information relative to the amount of interaction by the user with the 15 advertisement on the web page without actually "clicking on," or activating, the advertisement space. Therefore, the present invention is directed an improved system and method for obtaining web page advertisement user interaction data.

#### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a representative diagram of one or more servers and one or more user 20 computers interconnected through the Internet.

FIG. 2 is a graphic view of a browser GUI display for an example website, where the web page of the website illustrates one or more advertisements to the user and the user cursor is not on the advertisement space.

FIG. 3 is a graphic view similar to FIG. 2, where the user cursor is on the  
5 advertisement space.

#### DETAILED DESCRIPTION OF THE INVENTION

Referring now to the drawings in which like numerals represent like components throughout the several views, FIG. 1 illustrates the present inventive system for  
10 measuring user interaction with a defined space on a network site of a network, which is preferably the Internet 16 and the network sites are preferably websites 32 and web pages 39, as shown in FIGS. 2 and 3. The defined space is preferably an advertisement space 40 as shown in FIGS. 2 and 3, however, any defined space on a web page is alternately used as a reference point for determination of cursor activity as defined herein. The system  
15 comprises at least one server, shown as a cluster of web servers 12, in a server system environment 14 in communication with the Internet 16, such configuration being well known in the art. In the illustrated server system environment 14, the web server cluster 12 is connected through an Ethernet 20, or other local area network (LAN) to the Internet 16, and to a database server 22 and a database 24. The LAN is typically implemented  
20 through a router that also connects the server system 14 to the Internet 16 and provides addresses for the individual web servers of the web server cluster 12 on the Internet 16.

The database server 22 and database 24 allow the web servers to store data relative to the websites and web pages on database 24, which can include the web page advertisement impression data as further discussed herein. The disclosed system is simply illustrative of a common web server arrangement for the Internet 16, and the 5 present inventive system can be implemented without database server 22, database 24 and the Ethernet 20, or other LAN.

The system also includes at least one user computer, shown here as a plurality of user computers 18, in communication via the network, or Internet 16, with the server system environment 14 and the web server cluster 12. The user computers 18 each have a 10 browser program that enables the user computer to view the websites and web pages maintained on the web servers of web server cluster 12.

Referring to FIGS. 2 and 3, each web server hosts one or more websites, such as website 32 which is hypothetically located at ~~address http://www.website.com/sample~~ <sup>some fictitious web address</sup> ~~page~~. The browser on each of the user computers 18 has a GUI display 30 to load the 15 specific web page 39 of the website 32 where each website includes a web page display area 34 having a predefined space for web page material, such as web page material 38, and one or more predefined advertisement spaces, such as advertisement space 40. The advertising space 40 is typically a rectangular area on the web page display area 34, and can be a moving “banner ad” or have other executing programs in the advertisement space 20 40. The advertisement space 40 can also be a link to another website, such as the website

of that specific advertiser, if activated by the user. The browser thus allows the user computer 18 to selectively interact with the website 32 through the usage of a cursor 36 that can be manipulated by the user about the web page display area 34 of interactive website 32, and also manipulated about the browser GUI display 30.

5 FIG. 2 particularly illustrates the cursor 36 in the web page display area 34 and not on the predefined advertisement space 40. Once the cursor 36 is moved onto the advertisement space 40, as shown in FIG. 3, the user computer 18 selectively records interaction data relative to the cursor 36 placement on the specific advertisement space 40 on the display area 34. The user computer ultimately transmits the interaction data to the  
10 server system environment 14 hosting the advertisement space 40 on the interacted website 32. Alternatively, the interaction data can be sent to the website server for the interacted website 32, and can ultimately be stored in a local or remote database, such as local database 24, or the interaction data can be stored on the individual web server in the web server cluster 12. In this alternative approach, the user computer 18 preferably  
15 transmits the interaction data to the advertisement space host or the server system environment 14 at the conclusion of the interaction between the browser of the user computer 18 and the interacted website 32.

The system preferably utilizes a software-based algorithm to compute the number and quality of “ad impressions,” or an occurrence of the cursor 36 being placed onto the  
20 advertisement space 40. Because most of the commercially available web browsers provide the capability to programmatically track position of the cursor 36 within the browser GUI display 30 and have features for event handling, the system accordingly uses

these features to measure various actions taken by the user and can combine the measured actions to compute an ad impression quality index for a specific advertisement space, such as advertisement space 40.

It should be noted that the present invention could be used to track interaction  
5 other than impressions with the advertisement or other defined space. Any user  
interaction pattern within the browser GUI display 30 can be tracked, such as the number  
of errors made navigating a page or cursor interaction with various portions of the page.

Many of the common internet browsers such as Netscape Navigator and Microsoft  
Internet Explorer have Java/JavaScript functionality, and thus Javascript is the preferred  
10 language of implementation of the cursor tracking program. The cursor tracking program  
can be resident in the browser, or it can alternately be resident on the user computer or  
downloaded with a web page. Javascript is an object-oriented scripting language  
developed by Netscape for building client/server internet applications. One of ordinary  
skill in the art will realize that the algorithms disclosed herein can also be implemented  
15 using other programming languages, such as Java or ActiveX.

In implementing the algorithm, the program recognizes the entry of the cursor 36  
onto the advertisement space 40 and starts tracking the amount of time spent by the cursor  
36 until the cursor 36 is no longer on the specific advertisement space 40 or the browser  
has exited the website 32. This tracking can be implemented in JavaScript using a  
20 combination of the following Script Event Handlers, date/timer objects, and associated  
methods as follows:

Script Event Handlers:

onMouseOver: triggered when cursor moves over an object or area from outside that object or area.

5 onFocus/onBlur: triggered when a form element gains/loses focus or when a window or frame loses focus.

onClick: when an object on a form is clicked.

10 onDoubleClick: when the user double-clicks a form element or a link.

onMouseMove: when the user moves the cursor.

15 onMouseOut: each time the cursor leaves an area (client-side image map) or link from inside that area or link.

Timer Methods:

getTime: returns the number of milliseconds for a date object.

20 getDate: returns the day of the month for the specified date according to local time.

getDay: returns the day of the week for the specified date according to local time.

25 getFullYear: returns the year of the specified date according to local time.

getHours: returns the hour in the specified date according to local time.

getMilliseconds: returns the milliseconds in the specified date according to local time.

30 getMinutes: returns the minutes in the specified date according to local time.

getMonth: returns the month in the specified date according to local time.

35 getSeconds: returns the seconds in the specified date according to local time.

getTime: returns the numeric value corresponding to the time for the specified date according to local time.

getYear: returns the year in the specified date according to local time.

5 parse: returns the number of milliseconds in a date string since January 1, 1970, 00:00:00, local time.

UTC: returns the number of milliseconds in a Date object since January 1, 1970, 00:00:00, universal time.

10 The script event handlers allow tracking of the location of the cursor in the browser GUI display 34, and the Timer commands allow recordation of the time relative to the cursor 36 movements. Tracking of cursor 36 activity will continue until the onUnload event handle is triggered. When this event is triggered, it indicates that the user is exiting the web page 39. Once all the cursor 36 tracking inputs have been logged, the 15 algorithm computes a quality metric for that impression of the ads in the web page 39 and transmits the interaction data across the Internet 16 to the HTTP server, such as the servers in web server cluster 12, that originally served the web page 39 with the advertisement space 40.

Accordingly, examples of the preferred tracking parameters logged to compute the 20 ad impression quality index are; (1) the length of time the cursor is inside the advertisement space; (2) the number of times the advertisement space has input focus; (3) the number of times or the frequency of cursor entry and exit of the advertisement space; (4) the amount of time the user spends viewing this web page; and (5) the onSelect events, or an event indicating that the user has activated or “clicked” the advertisement 25 space link to the advertiser’s website.

An example of programmatically computing the quality index for an onSelect event is therefore:

```
if  (onSelect == "TRUE")
{
    Ad Impression Quality Index = 1
}
5
else
{
    Ad Impression Quality Index =(time in ad area/total time in page)
}
```

10        Depending on the focus of the advertiser and the expected feedback, this  
algorithm can be modified to customize the ad impression index and include additional  
measured parameters for the cursor 36 activity on the browser GUI display 30. Further, in  
order to minimize tracking of erroneous information, the cursor 36 tracking mechanism  
should preferably stop logging interaction data if there is no cursor 36 on the browser  
15        GUI display 30 for a specified threshold time period.

      The present inventive system as disclosed in FIGS. 1-3 accordingly provides an  
inventive method for measuring user interaction with an advertising space 40 on a  
network site (such as web page 39 of web site 32) hosted by a server on a network, such  
as the Internet 16. At least one user computer, such as one of user computers 18, is in  
20        communication therewith and has a browser that selectively interacts with the website 32,  
the user computer further having a cursor 36 manipulated by the user about the browser  
GUI display area 30 of an interacted website 32. The method includes the steps of  
interacting with a website 32 through the browser GUI display 30 on the user computer  
18, selectively recording interaction data on the user computer 18 relative to cursor 36  
25        placement on a specific advertisement space 40 on the web page display area 34 of the  
interacted website 32, and transmitting the interaction data to the server, or server system  
environment 14 hosting the advertisement space 40.

As discussed above, as the network is the preferably the Internet, the step of interacting with a network site is preferably interacting with a web site through the browser on the user computer. Accordingly, the step of selectively recording interaction data on the user computer relative to cursor placement on a specific advertisement space 5 on the display area of the interacted network site is preferably selectively recording interaction data on the user computer 18 relative to cursor 36 placement on a specific advertisement space 40 on the web page display area 34 of the interacted website 32 through execution of a Javascript program on the user computer.

Further, the step of transmitting the interaction data to the server hosting the 10 advertisement space 40 is preferably transmitting the interaction data to the server hosting the advertisement space 40 at the conclusion of the interaction between the browser of the user computer and the interacted website 32. The step of selectively recording interaction data on the user computer relative to cursor 36 placement on a specific advertisement space 40 on the web page display area 34 of the interacted website 32 is achieved by 15 selectively recording interaction data on the user computer relative to frequency of the cursor 36 placement on a specific advertisement space 40, or selectively recording interaction data on the user computer relative to the duration of the cursor 36 placement on a specific advertisement space 40. Frequency of cursor placement means, for example, the number of times the cursor enters and exits the advertisement area.

20 While there has been shown preferred and alternative embodiments of the present invention, it is to be understood that certain changes may be made in the forms and arrangements of the components and steps of the inventive method without departing

from the spirit and scope of the invention as set forth in the claims appended herewith.

What is claimed is: